# Rural and Urban Differences in Access to Mental Health Care Among Medicaid Enrolled Children

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## ABSTRACT

**Purpose:** One of the primary goals of health care reform is to ensure equitable access to healthcare and eliminate geographic disparities. Studies suggest that rural populations are particularly vulnerable to access problems due to the demographic composition of individuals residing in these areas and contextual characteristics. The purpose of this study was to examine rural/urban differences in access to mental health care (defined as the utilization of inpatient, outpatient, or emergency room services) for children enrolled in Ohio's Medicaid program.

**Methods:** The study population included all youths aged 0-17 who had: 1) a primary mental health diagnosis ; 2) at least one service claim for an outpatient, inpatient, or emergency room visit associated with a mental health disorder; and 3) were continuously enrolled in Medicaid during FY 2008. Data on individual, clinical, and contextual (county level) characteristics were abstracted from Medicaid eligibility/claims files, the Area Resource File, and the Ohio State Psychology and Social Work Licensure Boards. The primary explanatory variable, urban/rural status, was derived from the individual's county of residence and classified into three categories based on the Urban Influence Codes: metro (> 50,000), micro (>10,000 and <50,000 ), and rural (<10,000). Multivariable negative binomial regression and logistic regression analyses were used to examine rural and urban differences in utilization of mental health services.

**Results:** The results indicated significant differences in the utilization of outpatient mental health services ($\chi^2 = 87.8$, df = 2, $p < 0.001$), inpatient ($\chi^2 = 98.5$, df = 2, $p < 0.0001$), and emergency room services ($\chi^2 = 26.0$, df = 2, $p < 0.0001$) for youths living in rural areas compared to those living in metro or micro areas. Controlling for confounding variables, youths who lived in rural areas had a 14% decrease in the number of outpatient visits (IRR = 0.86, $p < 0.001$), a 37% decrease in the odds of being admitted to a psychiatric hospital (OR = 0.63, $p < 0.001$), and a 36% decrease in the odds of being admitted to an emergency room (OR = 0.64, p = 0.006).

**Discussion:** Study findings highlight geographic disparities in access to mental health services for children in Medicaid and emphasize the need to increase the supply of health care providers in rural areas to improve access.

## BACKGROUND

- Geographic disparities in access to care
  - Rural vs. urban residents receive less
    - Preventive and health services
    - Mental health visits
- Barriers to care for rural residents
  - Structural factors
    - low population density
    - higher poverty/unemployment rates
    - lower levels of health insurance
  - Shortage of providers and facilities
  - Transportation difficulties
  - Social and cultural factors

## OBJECTIVES

- To examine rural/urban differences in utilization of mental health services for children enrolled in Ohio Medicaid
- To test whether rural/urban differences persist after controlling for individual and contextual level factors associated with service utilization

## METHODS

- **Design**
  - Observational Cohort
    - Cross-sectional
- **Study Population**

  Inclusion Criteria
  - Primary Mental Health Diagnosis
  - ≥1 mental health claim
  - Continuously enrolled in Medicaid during FY 2008

  Exclusion Criteria
  - Primary Mental Retardation or Substance Abuse Diagnosis
- **Data Sources**
  - Medicaid Claims/Eligibility Files
  - Area Resource File
  - State Licensure Board Data Files
- **Model Specification**
  - Negative binomial regression
  - Logistic regression

- **Measures**

• Dependent Variables: Realized Access
  - Outpatient MH Visits
  - Inpatient Hospitalizations
  - Emergency Room Visits

• Key Explanatory Variable: Rurality

Based on Urban Influence Codes
  - *Metro*: counties with a city population of at least 50,000
  - *Micro*: counties with a city population of at least 10,000 and less than 50,000
  - *Rural*: all other counties, city populations of less than 10,000

- **Covariates**
  - Demographic Factors
    - age, race, gender, eligibility status
  - Clinical Factors
    - Primary mental health diagnosis
    - Comorbid psychiatric disorders
    - Comorbid medical disorders
    - Prior hospitalizations
  - Contextual Factors
    - Socio-demographic and Economic
      - % African American in county
      - % Hispanic in county
      - % persons in poverty/unemployed
      - Median household income
    - Health Care System Factors
      - Mental Health Specialists
      - Primary Care Providers
      - CMHCS in county
      - # of FQHCS in county
      - Ratio of Inpatient Beds

## RESULTS

Population Characteristics

Total = (N = 100,985)

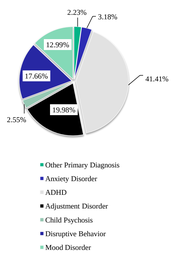
Age:
- 0-6 14.2%
- 7-12 48.0%
- 13-17 37.8%

Race:
- White 70.2%
- Black 28.5%
- Other 1.3%

Gender:
- Female 38.4%
- Male 61.6%

Eligibility:
- CFC 82.0%
- ABD 10.6%
- Foster 7.4%

Primary Mental Health Diagnosis:




Note: CFC = Covered Families and Children
ABD = Disabled Children

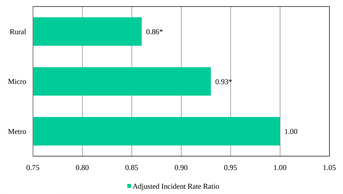
Mental Health Service Use Among Medicaid Enrolled Youths in Ohio by Rural/Urban Location

| | Metro Area (N=79,408 ) | | | Micro Area (N = 16,641) | | | Rural Area (N=4,936) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Mdn | Range | Mean | Mdn | Range | Mean | Mdn | Range |
| Outpatient Visits [a] | 9.3 | 5.0 | 0-399 | 8.7 | 5.0 | 0-128 | 7.7 | 4.0 | 1-317 |
| Specialty[b] | 7.5 | 4.0 | 0-397 | 6.8 | 3.0 | 0-126 | 5.6 | 2.0 | 0-316 |
| Non-Specialty[c] | 1.7 | 1.0 | 0-337 | 1.9 | 1.0 | 0-57 | 2.2 | 1.0 | 0-29 |

| | N | % | N | % | N | % |
|---|---|---|---|---|---|---|
| Any Inpatient [d] | 2,657 | 3.5 | 366 | 2.2 | 79 | 1.6 |
| Any ED Visits [e] | 1,482 | 1.9 | 249 | 1.5 | 52 | 1.1 |

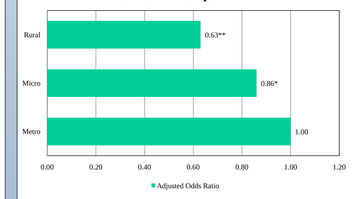
[a] Significant differences across rural and urban areas ($\chi2 = 87.8$ , df = 2, $p < 0.001$)
[b] Significant differences across rural and urban areas ($\chi2 = 373.4$, df = 2, $p <0.001$)
[c] Significant differences across rural and urban areas ($\chi2 = 314.9$, df= 2, $p <0.001$)
[d] Significant differences across rural and urban areas ($\chi2 = 98.5$, df = 2, $p <0.0001$)
[e] Significant differences across rural and urban areas ($\chi2 = 26.03$, df = 2, $p <0.0001$)

**Estimated Incident Rate Ratios of the Effect of Rural/Urban Location on Outpatient Visits**



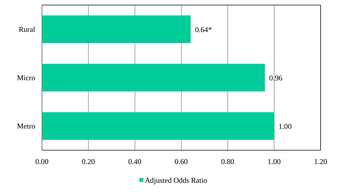

*p-value <0.001
Model adjusted for race, eligibility, percent African Americans in county, percent Hispanics in county, unemployment rate, median household income in thousands, community mental health centers, federally qualified health centers, ratio of inpatient beds, ratio of mental health specialists per 10,000 youth, and ratio of general healthcare providers per 10,000 youth

**Estimated Odds Ratios of the Effect of Rural/Urban Location on Hospital Use**




* p-value < 0.05 **p-value <0.001
Model adjusted for percent African Americans in county, unemployment rate, community mental health centers, federally qualified health centers, rand ratio of mental health specialists per 10,000 youth

**Estimated Odds Ratios of the Effect of Rural/Urban Location on Emergency Room Use**




*p-value <0.01
Model adjusted for race, eligibility, percent African Americans in county, percent Hispanics in county, unemployment rate, federally qualified health centers, ratio of mental health specialists per 10,000 youth, and ratio of general healthcare providers per 10,000 youth

## SUMMARY OF RESULTS

- Rural children are significantly *less likely* to receive:
  - outpatient mental health visits
  - any inpatient care
  - any emergency room visits
- The results indicated rural/urban differences in contextual-level factors, consistent with prior research:
  - Rural areas had higher poverty and unemployment rates
  - Lower supply of specialty and primary care providers
  - Lower availability of health facilities
- Significant rural/urban differences in likelihood of receiving outpatient, inpatient, and emergency room services were found after the effects of individual and contextual level factors were controlled.
  - Youths who lived in a rural area had a:
    - ➢ 14% decrease in outpatient visits;
    - ➢ 37% decrease in odds of hospitalization;
    - ➢ 36% decrease in odds of having an ED visit

## STRENGTHS AND LIMITATIONS

Strengths
- Population Data
- Controlled for individual and contextual-level factors
- Distinguished between adjacent and non-adjacent rural areas

Limitations
- Measurement issues- realized access vs. potential access
- Lack of data on other factors that affect access (health attitudes, help-seeking behavior)
- Observational design precludes causal inferences

## CONCLUSIONS AND IMPLICATIONS

- Policy
  - Evidence of geographical disparities in access to mental health service use
  - Efforts to improve access should focus on provider supply and social/economic factors
- Research
  - Determine what *other* barriers exist for preventing access to mental health services
  - More in-depth analysis needed on the relationship between provider supply and access to care